ILLINOIS DCEO / UTILITY CODE SUPPORT PROGRAM
Commercial Energy Savings Calculation Methodology

1) Calculate ASHRAE 90.1-2010 code compliant energy use (kbtu/sf) for electric and natural gas for each commercial building type for Climate Zone 5A and Climate Zone 4A from PNNL Report, Appendix F [1].
2) Calculate ASHRAE 90.1-2004 code compliant energy use (kbtu/sf) for electric and natural gas for each commercial building type for Climate Zone 5A and Climate Zone 4A from PNNL Report, Appendix F [1].
3) Calculate average commercial construction activity (new and additions) for the period 2009-2011 for each county from REED Construction Data [2].
4) Calculate average commercial construction activity (new and additions) for the period 2009-2011 for each county by building type and by size (square feet) from REED Construction Data [2].
5) Calculate the average number of multi-family buildings (a building with over 2 units is required to comply with the commercial energy code) for the 2009-2011 period from US Census data [3].
6) Calculate average annual ASHRAE 90.1-2010 energy consumption for commercial construction (new and additions) for each utility territory (Climate Zone 4 – Ameren, Climate Zone 5 – ComEd, Nicor, Peoples Gas and Integrys). Total building type SF per utility territory * code compliant energy use per SF.
7) Calculate average annual ASHRAE 90.1-2004 energy consumption for commercial construction (new and additions) for each utility territory (Climate Zone 4 – Ameren, Climate Zone 5 – ComEd, Nicor, Peoples Gas and Integrys). Total building type SF per utility territory * code compliant energy use per SF.
8) Where a REED building type did not have a corresponding PNNL building type (PNNL building types cover approximately 70% of commercial construction), a weighted average of PNNL derived energy use was used.
9) The difference between the ASHRAE 90.1-2004 energy use (modeled as a non-compliant building) and the ASHRAE 90.1-2010 energy use (compliant building) equals the potential energy savings.
10) The 2009-2011 average square footage was increased based on the 2014-2016 commercial construction forecast provided by ComEd. The same percentage increase in construction was assumed to apply to all other utility territories. Each investor owned utility territory was mapped by county. Where more than one electric or gas utility serves a county, the construction activity was divided proportionally.
11) Potential energy savings / average annual construction (square feet) = potential commercial energy savings per square foot.

[1] Achieving the 30% Goal: Energy and Cost Savings Analysis of ASHRAE Standard 90.1-2010. PNNL-20405.
[2] REED Construction Data – Illinois, 2009-2011.

12) It was assumed that the utility program would move an average of 10% of commercial construction from non-compliant (ASHRAE 90.1-2004) to compliant (ASHRAE 90.1-2010) – 5% first year, 10% second year and 15% third year.[3]
13) Potential commercial savings per square foot * commercial square feet * percent of SF affected by program = program claimable savings.

[3] A compliant commercial building was assumed to meet all the requirements of the 2012 Illinois Energy Conservation Code (which is mostly equivalent to the 2012 International Energy Conservation Code (IECC)). A non-compliant commercial building was deemed to meet ASHRAE 90.1-2004. It was assumed that non-compliant building would be built to earlier versions of the code (what contractors are used to building). Once the code compliance study is completed, there will be a much better idea of the deficiencies in a non-compliant building.